Racial and Ethnic Disparities in Traffic Stops and Stop Outcomes in Springfield, Missouri: 2012-2016

Mike Stout, Ph.D.
8-8-2017

Table of Contents

Executive Summary

This report, requested by Springfield Police Department's Chief Paul Williams, summarizes the results of a study of racial disparities in traffic stops, vehicle searches, driver arrests, and contraband hits for the city of Springfield, Missouri over a five-year timeframe from 2012 to 2016.

The results of the study suggest that there were substantial disparities in the rate at which African-Americans were stopped, and that the disparities increased, from 2012 to 2016 in Springfield. Some of this disparity is attributable to the fact that African-Americans are stopped for investigative purposes than would be predicted given their overall proportion of stops.

When African-Americans are stopped they are more likely to be searched and arrested than would be predicted given their proportion of stops and searches, respectively. It does not appear that the disparity in searches for African-Americans is attributable to a greater propensity to be in possession of contraband than would be predicted given their proportion of searches.

Census tracts with a lower average number of African-American traffic stops were less diverse racially and had larger populations than the moderate and high stop tracts, whereas the tracts with the highest average number of African-American traffic stops tended to be more racially diverse and smaller than low and moderate stop tracts. Geographically, the tracts that had the highest number of African-American stops between 2012 and 2016 were clustered in Central Springfield just north and south of E Grand St., and in North Central Springfield between I-44 and State Rte. 744.

Mike Stout, Ph.D., Associate Professor and the George Kaiser Family Foundation Chair in Family and Community Policy at Oklahoma State University was the primary investigator on this study and wrote the report. Questions or comments should be directed to Dr. Stout at michael.stout@okstate.edu or (918)594-8311.

Introduction

This report summarizes the results of an analysis of racial disparities in traffic stops, searches, arrests, and contraband hits for the city of Springfield, Missouri from 2012 to 2016. The results suggest that there is a consistent pattern of substantial disparities in traffic stops of African-Americans in the city and that the highest number of stops tend to be in census tracts with higher proportions of race/ethnic minorities and smaller population sizes. While some argue that racial disparities in traffic stops are symptoms of systematic bias, or racial profiling, on the part of the police, it is important to remember that the motivations of individual police officers is incredibly difficult to discern using the type of data examined in this report.

According to Abramosky and Edelstein (p. 730)[1], "a racial profile is an explicit policy, either written or unwritten, of targeting suspects for search and arrest on the basis of race." Racial profiling is a violation of federal law under the 14th Amendment's Equal Protection Clause[2].

Prior research has shown that there are many factors that can account for racial disparities in traffic stops that are not related to racial profiling. Data showing evidence of racial disparities in traffic stops is necessary but not sufficient for proving that racial profiling exists in a community. Unfortunately, due to the limitations of the empirical data that is available, only a small number of these other possible factors were able to be examined in this study, which makes it difficult to reach a definitive conclusion as to whether or not the Springfield Police Department (SPD) engages in the practice of racial profiling.

It is recommended that the results of the study summarized in this report be used as a basis for to continuing dialogue between the Springfield Police Department and the citizens of Springfield on why substantial racial disparities in traffic stops and stop outcomes exist in the city. The results should also be used to work with the community on strategies, training, and policies to be pursued in order to address the disparities.

A Note on the Data

This report will summarize all of the traffic stop data in the city of Springfield as it pertains to racial disparities for the years 2012-2016.

According to the Missouri Attorney General's website[3]:

"Concerns by the citizens of Missouri and the Missouri legislature regarding allegations of racial profiling by law enforcement prompted the passage in 2000 of Section 590.650, RSMo. That statute requires that all peace officers report specific information—including a driver's race—for each vehicle stop made in the State."

---

[1] Abraham Abramovsky and Jonathan I. Edelstein. 2000. "Pretext Stops and Racial Profiling After *Whren v. United States*: The New York and New Jersey Response Compared." *Albany Law Review* Vol. 63(3): 725-742.

[2] For details of the Equal Protection Clause see http://www.law.cornell.edu/wex/Equal_protection

[3] https://ago.mo.gov/home/vehicle-stops-report

Section 590.650 of Missouri Revised Statutes specifies the information that law enforcement officers must collect when they make a traffic stop.[4] Specifically:

"Each time a peace officer stops a driver of a motor vehicle, that officer shall report the following information to the law enforcement agency that employs the officer:

1. The age, gender and race or minority group of the individual stopped;
2. The reasons for the stop;
3. Whether a search was conducted as a result of the stop;
4. If a search was conducted, whether the individual consented to the search, the probable cause for the search, whether the person was searched, whether the person's property was searched, and the duration of the search;
5. Whether any contraband was discovered in the course of the search and the type of any contraband discovered;
6. Whether any warning or citation was issued as a result of the stop;
7. If a warning or citation was issued, the violation charged or warning provided;
8. Whether an arrest was made as a result of either the stop or the search;
9. If an arrest was made, the crime charged; and
10. The location of the stop."

This report examines and summarizes the traffic stop data collected by the Springfield Police Department for its annual report for the years 2012 to 2016.

How is race measured?

In the state of Missouri the race of the driver must be determined and recorded by the officer making the stop, not by the operator of the vehicle. According to the Missouri Attorney General's website[5], there are two reasons for this:

1. If an officer is profiling based on race, that officer is deciding to pull the driver over based on the officer's perception of that driver's race.
2. If the officer questions the driver about his race, the driver may become confrontational or think his rights are being violated.

Since the driver's race/ethnic status is measured based on the officer's *perception* it is likely that some groups are underrepresented and others are overrepresented in the traffic stop data, particularly with regard to the status of Hispanic drivers. For example, an officer may classify lighter skinned drivers who are Hispanic as White; while darker skinned Hispanic drivers may be classified as African-American. The rate of such incidences is difficult to calculate but it is worth noting that they may bias, positively or negatively, the disparity indicators presented and summarized in this report.

Using Census Data as a Benchmark

In order to try to explain the racial disparities in traffic stops in the city of Springfield this study compares traffic stop data to population characteristics of the city derived from the 2010 U.S.

[4] http://revisor.mo.gov/main/OneSection.aspx?section=590.650&bid=30357&hl=
[5] https://ago.mo.gov/home/vehicle-stops-report/vehicle-stops-faqs

Census. Specifically, it compares driver characteristics to the characteristics of the overall driving age (16+) population of the city. This study also takes into account some of the contextual characteristics of the neighborhoods in which stops occur. For the purposes of this study, census tracts were used to delineate the geographic boundaries of neighborhoods in the city. Specifically, the analysis examines whether the overall racial composition of census tracts where a stop occurs was related to racial disparities in traffic stops.

Weakness of Using 2010 Census Data as Benchmark:
Census data measures the residential population of a given area. Whether the driving population of the same area shares the demographic profile of the residential population is an important concern. Surveys of transportation and vehicle-ownership rates have suggested that the minority driving population may be significantly different from the minority residential population in a state or locality.[6]

In an effort to account for some of the weaknesses in using census data, this report looks only at the segment of the city's population that was 16 years of age and older at the time of the 2010 Census. However, while this may provide a somewhat more reliable estimate of the driving population for a given area of the city, there are significant weaknesses that must be mentioned:

1. Just because someone is over the age of 16 does not necessarily mean that they have a driver's license or a car. In fact, recent studies have found that younger Americans are less likely to have a driver's license or access to a car than they were in the past.[7] Ideally, benchmark data for racial disparities in traffic stops would be based on data pertaining to the city's official driving population. However, the Missouri Department of Motor Vehicles does not include a field for race/ethnicity when administering driver's licenses, so that information was unavailable for this study.
2. The Census data used for benchmark comparisons are nearly eight years old, and the demographic characteristics of the city have changed for the various race/ethnic groups over the years, which means that the census data used for this study are rough approximations of the overall population, at best, so the results must be understood in this context.

With these limitations in mind, the results of an analysis of racial disparities in traffic stops in Springfield from 2012 to 2016 are examined in detail and summarized below.

[6] Michael R. Smith and Geoffrey P. Alpert. 2002. "Searching for Direction: Courts, Social Science, and the Adjudication of Racial Profiling Claims." *Justice Quarterly* Vol. 19(4): 673-303.
[7] http://www.umtri.umich.edu/our-results/publications/reasons-recent-decline-young-driver-licensing-united-states

Table 1. Demographic Characteristics and Disparity Index Values for Traffic Stops in Springfield, MO (2012-2016)[8]

	N Stops: 2012-2016	Percentage of Population16+ (2010 U.S. Census)	Average Percentage of Stops: 2012-2016	Average Disparity Index: 2012-2016	Average Rate: 2012-2016
All Traffic Stops	132,607		100%		19.88
White	115,134	90.2%	86.8%	0.96	18.74
African-American	12,181	3.8%	9.2%	2.42	47.94
Hispanic/Latino	2,572	3.1%	1.9%	0.64	12.62
Asian	1,757	1.9%	1.3%	0.68	13.58
Native American	124	0.8%	0.001%	0.12	2.44
Other	839	3.3%	.01%	0.19	3.84
White Male	68,627		60.0%		
White Female	46,507		40.0%		
African-American Male	8,574		70.4%		
African-American Female	3,607		29.6%		
Hispanic/Latino Male	1,850		72.0%		
Hispanic/Latino Female	722		28.0%		
Asian Male	1,051		60.0%		
Asian Female	706		40.0%		
Native American Male	76		60.5%		
Native American Female	48		39.5%		
Other Male	685		81.7%		
Other Female	154		18.3%		
White Resident	88,108		76.6%		
African-American Resident	10,901		89.5%		
Hispanic/Latino Resident	2,010		78.1%		
Asian Resident	1,485		84.5%		
Native American Resident	95		77.0%		
Other Resident	651		77.2%		

[8] See Appendix for formula used to calculate disparity index.

Table 2. Percentage of Stops Where Race of Driver was Identified Prior to Stop: 2012-2016

	2012	2013	2014	2015	2016
White	17.3%	13.9%	12.7%	12.8%	10.5%
African-American	16.2%	13.6%	13.8%	12.5%	11.4%
Hispanic/Latino	9.7%	6.6%	8.3%	6.7%	5.6%
Asian	3.8%	4.9%	3.6%	3.5%	2.9%
Native American	3.8%	0.0%	0.0%	0.0%	3.8%
Other	4.2%	5.0%	1.3%	6.0%	3.5%

Summary of Demographic Characteristics and Disparities in Traffic Stops: 2012 to 2016

Table 1 (above) provides data on the demographic characteristics of the driving age population and the average disparity index for traffic stops that occurred between 2012 and 2016 in Springfield, MO. Some of the highlights include the following:

- African-Americans comprise just under four percent of the city's driving age population, but comprised just over nine percent of all traffic stops, on average. They were the only group whose average percentage of stops exceeded their percentage of the driving age population.
- African-Americans were also the only group with an average disparity index over 1.00 between 2012 and 2016. African-American drivers were nearly 2.5 times more likely to be stopped than would be predicted given their percentage of the driving age population.
- African-Americans had the highest average stop rate. The African-American average stop rate was 47.94 per 100 driving age African-Americans between 2012 and 2016, which was nearly 2.5 times the average overall stop rate per 100 driving age Springfieldians. All other groups were stopped at a rate lower than the overall average.
- The majority of all traffic stops were male. A higher percentage of African-American and Hispanic/Latino males were stopped in comparison to other race/ethnic groups.
- Nearly ninety percent of African-Americans who were stopped were Springfield residents, the highest among all race/ethnic groups. Comparatively, the percentage of white residents who were stopped was about seventy-seven percent.

Table 2 provides a summary of the percentage of stops where the officer determined the driver's race prior to the stop for the five-year period encompassing 2012 to 2015. The data show that:

- Race was determined prior to the stop most often for white and African-American drivers.
- In each year, the race of the driver was not determined until after the stop for the majority of stops for all races.
- Over time, the percentage of stops where the driver's race was determined prior to the stop has declined for white drivers, African-American drivers, and Hispanic/Latino drivers.

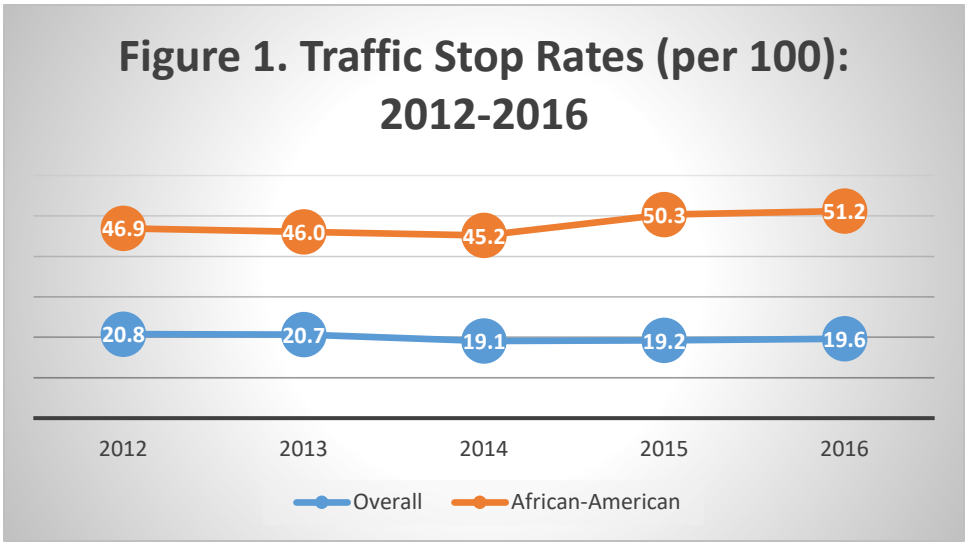
Year-by-Year Summaries of Traffic Stops for African-American Drivers from 2012 to 2016[9]

Table 3 and Figure 1 report the data on the number of African-American traffic stops by year, with comparisons for their rates and disparity index scores to the city's overall rates and disparity index scores.

Table 3. African-American Traffic Stops: 2012-2016

		All Stops	African-American Stops
2012	N	27,720	2,385
	Percentage		9.6%
	Disparity		2.26
	Rate	20.8	46.9
2013	N	27,591	2,339
	Percentage		8.5%
	Disparity		2.23
	Rate	20.7	46.0
2014	N	25,440	2,296
	Percentage		9.0%
	Disparity		2.37
	Rate	19.1	45.2
2015	N	25,655	2,558
	Percentage		9.9%
	Disparity		2.62
	Rate	19.2	50.3
2016	N	26,201	2,603
	Percentage		9.9%
	Disparity		2.61
	Rate	19.6	51.2

[9] See Appendix for formulas used to generate statistics for this section.



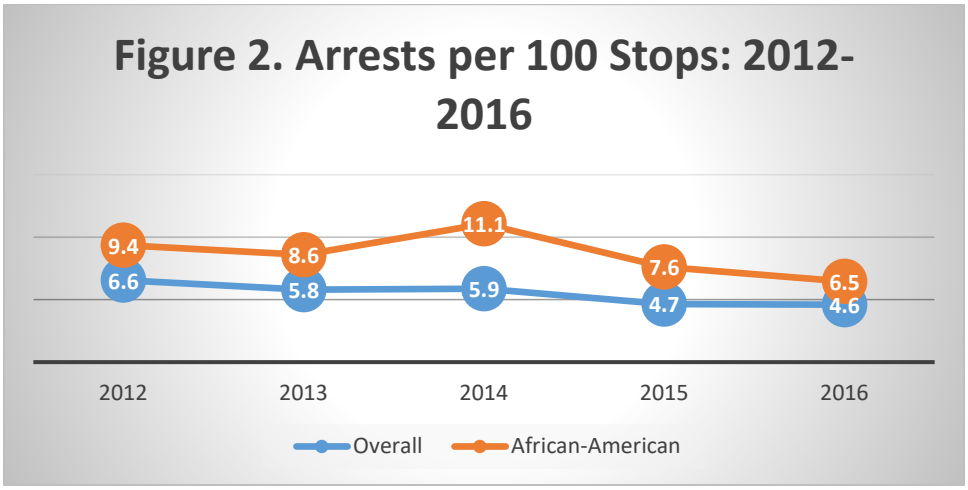
- The disparity index for African-Americans increased from about 2.2 in 2012 and 2013 to about 2.6 in 2015 and 2016.
- The stop rate for African-Americans increased from about 47 per 100 driving age African-Americans to about 51 per 100 between 2012 and 2016, with the largest increase in the rate occurring between 2014 and 2015. At the same time, the overall stop rate declined slightly from a high of 20.8 per 100 driving age residents in 2012 to 19.6 per 100 in 2016.
- The gap between the African-American stop rate and the city's overall stop rate increased from 26.9 per 100 in 2012 to 31.6 per 100 in 2016, reflecting a relative increase of 17.5 percent in the gap.

Stops Resulting in Arrest

Table 4 and Figure 2 report the data on the number of African-American traffic stops that resulted in an arrest by year, with comparisons for their rates and disparity index scores to the city's overall rates and disparity index scores.

Table 4. African-American Arrests per Stop: 2012-2016

		All Arrests	African-American Arrests
2012	N	1,817	223
	Percentage		12.3%
	Disparity		1.43
	Rate	6.6	9.4
2013	N	1,603	201
	Percentage		12.5%
	Disparity		1.48
	Rate	5.8	8.6
2014	N	1,495	254
	Percentage		17.0%
	Disparity		1.88
	Rate	5.9	11.1
2015	N	1,194	195
	Percentage		16.3%
	Disparity		1.64
	Rate	4.7	7.6
2016	N	1,205	168
	Percentage		13.9%
	Disparity		1.40
	Rate	4.6	6.5



- The percentage of African-American stops that resulted in arrest was around 12 percent in 2012 and 2013, 17 percent in 2014, 16.3% in 2015, and 13.9% in 2016.
- There was not a clear linear pattern in the disparity index for African-American stops resulting in arrest between 2012 and 2016. African-American stops resulted in arrest 43

percent more of the time than would be predicted based on their proportion of stops in 2012; the disparity index for African-American stops resulting in arrest increased until 2016, when it was 40 percent greater than would be predicted based on their proportion of stops.

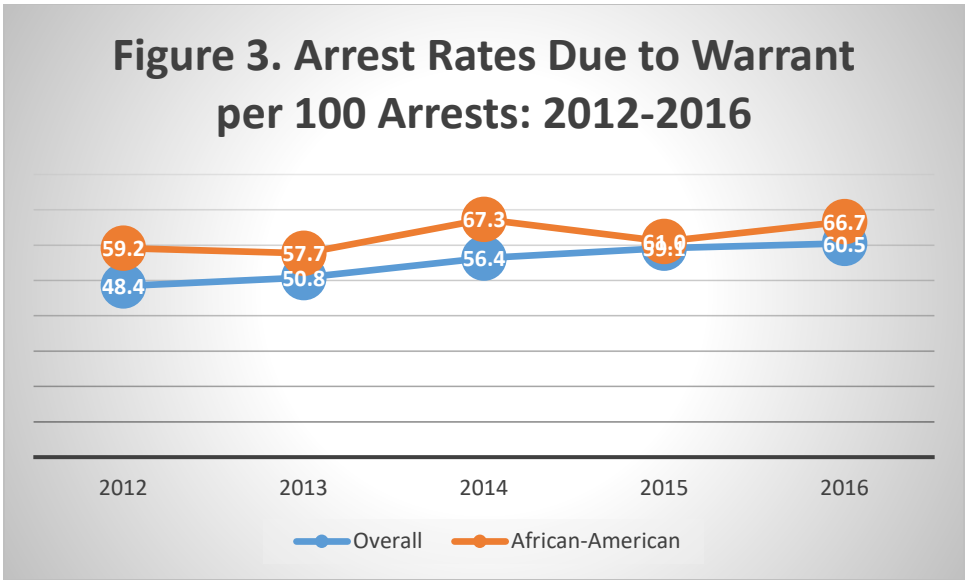
- The rate for African-American arrests fell from 9.4 per 100 stops in 2012 to 6.5 per 100 stops in 2016; a 30.85 percent relative decrease. There was a spike in the arrest rate in 2014 at 11.1 arrests per 100 stops.
- The gap in the rate at which African-American stops resulted in arrest and the city's overall rate declined from 2.8 per 100 stops in 2012 to 1.9 per 100 stops in 2016. There was a spike in the gap in 2014, which was 5.2 per 100.

Reason for Arrest

The police department collects data on reasons for arrest during a traffic stop. The most frequent reasons for arrest are: 1) the driver had a warrant out for their arrest; 2) drugs were found during the stop; 3) the driver committed a traffic violation that resulted in their arrest; and 4) the driver was driving while intoxicated (DWI). Tables 5 through 9, and Figures 3 through 6, below summarize the reasons for arrest for African-American drivers from 2012 to 2016.

Table 5. African-American Drivers Arrested due to Warrant: 2012-206

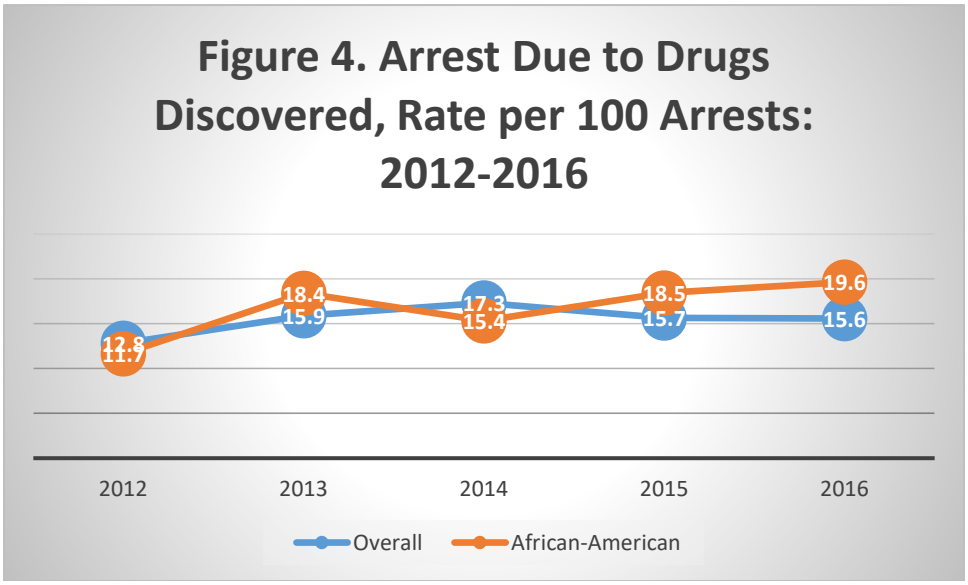
		All Warrant Arrests	African-American Warrant Arrests
2012	N	880	132
	Percentage		59.2%
	Disparity		4.82
	Rate	48.4	59.2
2013	N	815	116
	Percentage		57.7%
	Disparity		4.60
	Rate	50.8	57.7
2014	N	843	171
	Percentage		67.3%
	Disparity		3.96
	Rate	56.4	67.3
2015	N	706	119
	Percentage		61.0%
	Disparity		3.73
	Rate	59.1	61.0
2016	N	729	112
	Percentage		66.7%
	Disparity		4.78
	Rate	60.5	66.7



- African-American drivers were arrested due to warrant approximately four to five times more than would be expected given their proportion of all arrests between 2012 and 2016.
- Between 60 percent and 70 percent of all African-American drivers whose stops ended in arrest were arrested due to warrant from 2012 to 2016.
- African-American drivers were arrested at a higher rate than all drivers over the five year period.

Table 6. African-American Drivers Arrested due to Drugs Discovered: 2012-206

		All Drug Arrests	African-American Drug Arrests
2012	N	233	26
	Percentage		11.6%
	Disparity		0.95
	Rate	12.8	11.6
2013	N	255	37
	Percentage		18.4%
	Disparity		1.47
	Rate	15.9	18.4
2014	N	259	39
	Percentage		15.3%
	Disparity		0.90
	Rate	17.3	15.3
2015	N	187	36
	Percentage		18.5%
	Disparity		1.13
	Rate	15.7	18.5
2016	N	188	33
	Percentage		19.6%
	Disparity		1.41
	Rate	15.6	19.6

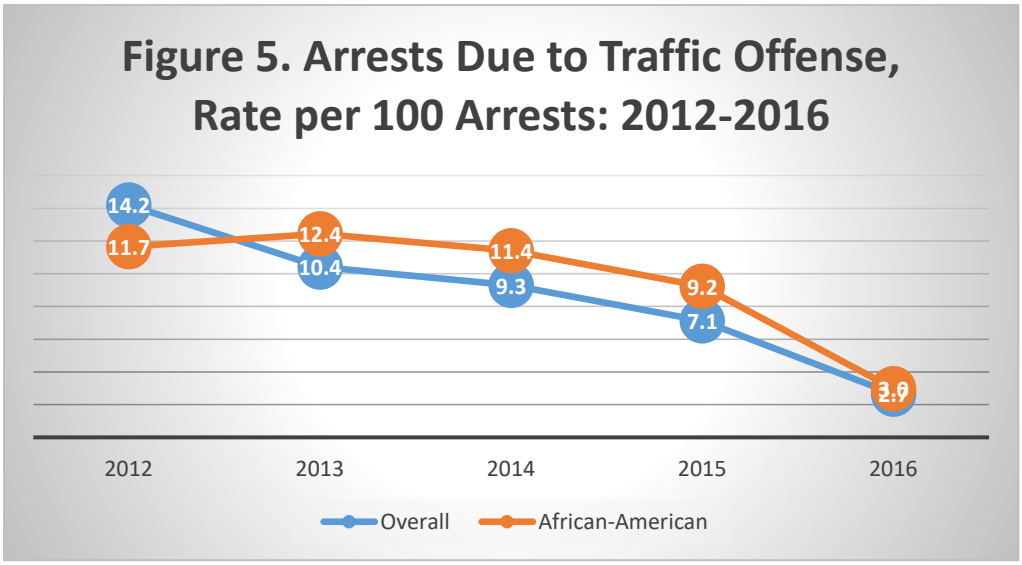


- There was not a clear trend in the percentage of African-American drivers who were stopped as a result of drugs being discovered during the stop. In 2012 and 2015 the proportion of African-American drivers who were arrested for drug possession was lower

than would be predicted given their proportion of all arrests. In 2013, 2014, and 2016 the proportion of African-American drivers who were arrested for drug possession was somewhat higher than would be predicted given their proportion of all arrests.

Table 7. African-American Drivers Arrested due to Traffic Offense: 2012-206

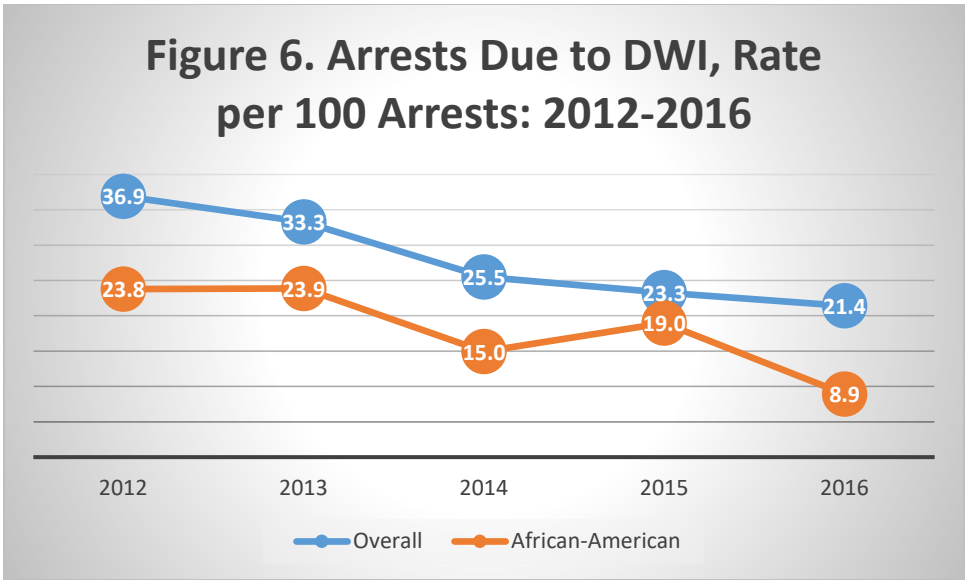
		All Warrant Arrests	African-American Warrant Arrests
2012	N	258	26
	Percentage		11.6%
	Disparity		0.95
	Rate	14.2	11.6
2013	N	167	25
	Percentage		12.4%
	Disparity		0.99
	Rate	10.4	12.4
2014	N	139	29
	Percentage		11.4%
	Disparity		0.67
	Rate	9.3	11.4
2015	N	85	18
	Percentage		9.2%
	Disparity		0.56
	Rate	7.1	9.2
2016	N	32	5
	Percentage		3.0%
	Disparity		0.21
	Rate	2.6	3.0



- The percentage of drivers who were arrested due to an arrestable traffic offense declined overall and for African-Americans between 2012 and 2016. The arrest rate per 100 arrests for traffic offenses also declined substantially over that period.
- The proportion of African-American drivers who were arrested for traffic offenses was substantially lower than would be predicted given their proportion of all arrests in each of the five years.

Table 8. African-American Drivers Arrested due to DWI: 2012-206

		All DWI Arrests	African-American DWI Arrests
2012	N	671	53
	Percentage		23.8%
	Disparity		1.94
	Rate	36.9	23.8
2013	N	534	48
	Percentage		23.9%
	Disparity		1.90
	Rate	33.3	23.9
2014	N	381	38
	Percentage		15.0%
	Disparity		0.88
	Rate	25.5	15.0
2015	N	278	37
	Percentage		19.0%
	Disparity		1.16
	Rate	23.3	19.0
2016	N	258	15
	Percentage		9.0%
	Disparity		0.64
	Rate	21.4	9.0



- Drivers arrested due to DWI declined substantially from 2012 to 2016 for all drivers and for African-American drivers. The rate of DWI arrests also declined substantially over that period.
- There was not a clear trend in the proportion of African-Americans arrested for DWI over the five-year period. In 2014 and 2016, the proportion of African-American drivers arrested for DWI was lower than would be predicted given their proportion of all arrests, but it was higher in 2012, 2013, and 2015.
- The DWI arrest rate for African-Americans was lower than the overall rate each year over the five-year period.

Reason for Stop

Tables 9 through 12, and Figures 7 though 10, report the data on the reasons for African-American traffic stops by year, with comparisons for their rates and disparity index scores to the city's overall rates and disparity index scores.

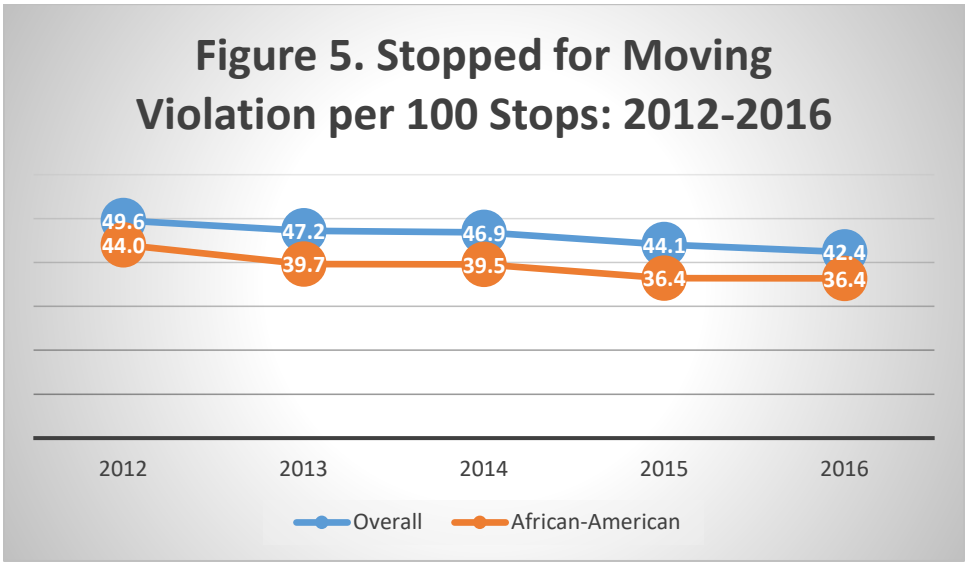
The data capture four reasons why a driver might be stopped in Springfield. The Springfield Police Department describes those reasons as follows:

1. **Moving violations --** driving the wrong way on a one way street, speeding, any type of stop sign or signal violation, failing to yield to emergency vehicle, failing to stop for a school bus, driving on the sidewalk, passing violation, careless and imprudent driving, etc.
2. **Equipment violations** – headlight violations, taillight violations, motorcycle driver with no helmet, obstructed view, etc.
3. **License violations** – a vehicle displaying no license plate, license plates that don't check to that vehicle, license plates that don't display a current annual registration tab, license plates displayed incorrectly, etc.
4. **Investigative stops** – stops related to a crime where an officer has reason to believe the vehicle or driver was involved in a crime, stops where an officer has reason to believe the

driver has no driver's license (personal knowledge or an MDT check while moving), stops where an officer has reason to believe the driver or occupants have a warrant (personal knowledge or an MDT check on the plate while moving), etc.

Table 9. African-Americans Stopped for Moving Violation: 2012-2016

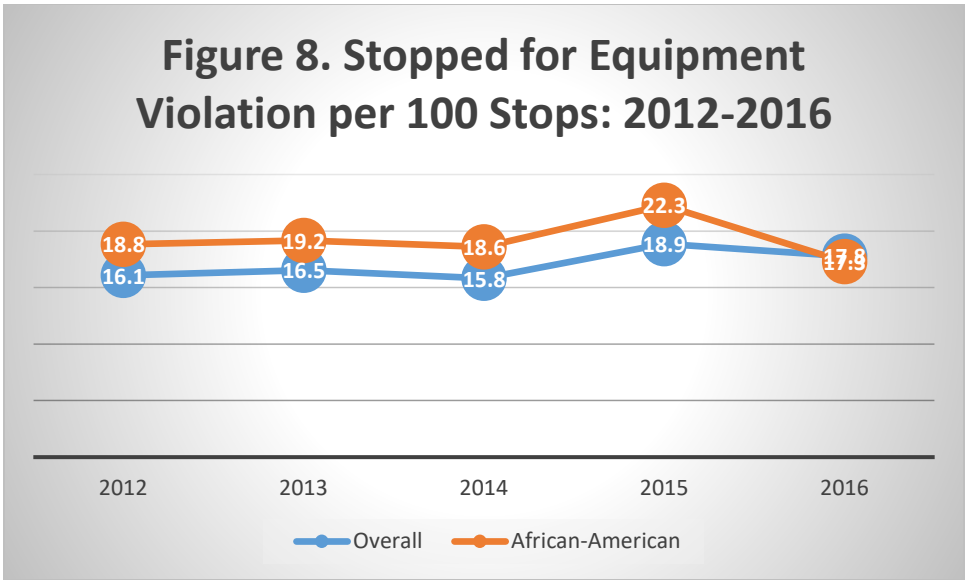
		All Moving Violations	African-American Moving Violations
2012	N	13,742	1,050
	Percentage		7.6%
	Disparity		0.89
	Rate	49.6	44.0
2013	N	13,029	928
	Percentage		7.1%
	Disparity		0.84
	Rate	47.2	39.7
2014	N	11,929	908
	Percentage		7.6%
	Disparity		0.84
	Rate	46.9	39.5
2015	N	11,305	932
	Percentage		8.2%
	Disparity		0.83
	Rate	44.1	36.4
2016	N	11,104	947
	Percentage		8.5%
	Disparity		0.86
	Rate	42.4	36.4



- African-American drivers comprised 7 percent (in 2013) to 8.5 percent (in 2016) of stops for moving violations between 2012 and 2016.
- The disparity index for African-American stops due to moving violations was below 1.0 for all years, indicating that they were stopped for moving violations less than would be predicted given their overall proportion of stops each year.
- The rate at which African-American drivers were stopped for moving violations declined from 44 per 100 stops in 2012 to 36.4 per 100 stops in 2016.
- The rate at which African-American drivers were stopped for moving violations was lower than the city average rate of stops for moving violations for each of the five years.

Table 10. African-Americans Stopped for Equipment Violation: 2012-2016

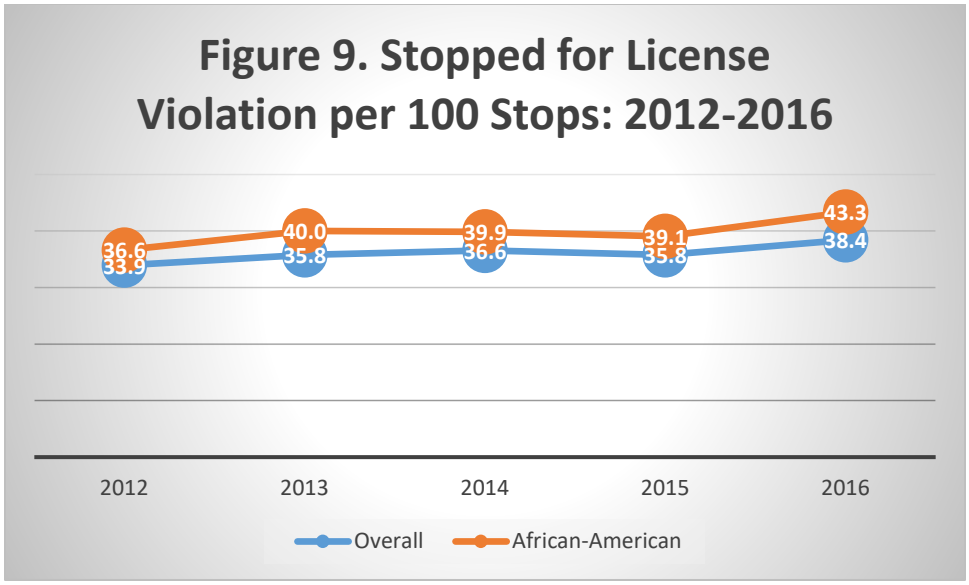
		All Equipment Violations	African-American Equipment Violations
2012	N	4,454	449
	Percentage		10.1%
	Disparity		1.17
	Rate	16.1	18.8
2013	N	4,560	448
	Percentage		9.8%
	Disparity		1.16
	Rate	16.5	19.2
2014	N	4,024	427
	Percentage		10.6%
	Disparity		1.17
	Rate	15.8	18.6
2015	N	4,841	570
	Percentage		11.8%
	Disparity		1.18
	Rate	18.9	22.3
2016	N	4,656	450
	Percentage		9.7%
	Disparity		0.97
	Rate	17.8	17.3



- African-American drivers comprised about 10 percent of stops for equipment violations each year between 2012 and 2016.
- From 2012 to 2015, the disparity index for African-American stops for moving violations was around 1.17, which indicates that they were slightly more likely to be stopped for moving violations than would be predicted given their proportion of all stops. In 2016, the disparity index was .97, meaning their proportion of stops for moving violations was about equal to what would be predicted given their overall proportion of stops.
- The rate of stops for African-Americans that were due to equipment violations was somewhat higher than for the overall population from 2012 to 2015. However, in 2016 the rate for African-Americans stopped for equipment violations was slightly lower than the overall rate.

Table 11. African-Americans Stopped for License Violation: 2012-2016

		All License Violations	African-American License Violations
2012	N	9,408	874
	Percentage		9.3%
	Disparity		1.08
	Rate	33.9	36.6
2013	N	9,867	936
	Percentage		9.5%
	Disparity		1.12
	Rate	35.8	40.0
2014	N	9,310	915
	Percentage		9.8%
	Disparity		1.09
	Rate	36.6	39.9
2015	N	9,175	999
	Percentage		10.9%
	Disparity		1.09
	Rate	35.8	39.1
2016	N	10,064	1,128
	Percentage		11.2%
	Disparity		1.13
	Rate	38.4	43.3



- African-American drivers comprised about nine percent of stops for license violations in 2012 and about eleven percent in 2016.

- The disparity index for African-American stops due to license violations was slightly above 1.0 for each year from 2012 to 2016, indicating they were slightly more likely to be stopped for license violations than would be predicted given their proportion of all stops.
- The rate at which African-Americans were stopped due to license violations increased from 36.6 per 100 stops in 2012 to 43.3 per 100 stops in 2016.
- There was a consistent gap in stops for license violations of approximately 5 per 100 stops between African-Americans and all drivers from 2012 to 2016. The overall rate had a relative increase of 13.2 percent and the African-American rate had a relative increase of 18.3 percent over that period.

Table 12. African-Americans Stopped for Investigative Purposes: 2012-2016

		All Investigative	African-American Investigative
2012	N	844	100
	Percentage		11.8%
	Disparity		1.38
	Rate	3.0	4.2
2013	N	916	140
	Percentage		15.3%
	Disparity		1.80
	Rate	3.3	6.0
2014	N	855	140
	Percentage		16.4%
	Disparity		1.81
	Rate	3.4	6.1
2015	N	911	161
	Percentage		17.7%
	Disparity		1.77
	Rate	3.6	6.3
2016	N	705	119
	Percentage		16.9%
	Disparity		1.70
	Rate	2.7	4.6

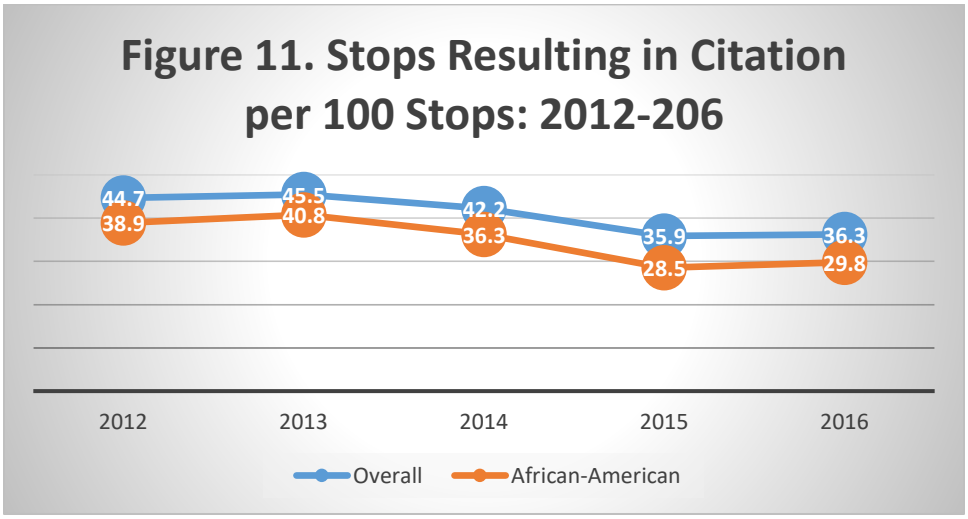
- The percentage of stops for investigative purposes for African-American drivers increased from 11.6 percent in 2012 to 16.9% in 2016, and it peaked at 17.7 percent in 2015.
- There was an increase in the disparity index for investigative stops for African-Americans from 1.38 in 2012 to 1.70 in 2016. Between 2013 and 2016, the proportion of African-American drivers who were stopped for investigative purposes was between 70 and 80 percent higher than would be predicted given their overall proportion of stops.
- The rate of stops for investigative purposes per 100 African-American stops increased from 4.2 per 100 stops in 2012 to 6.3 per 100 stops in 2015. The rate declined to 5.6 per 100 stops in 2016.
- The gap in rates of stops for investigative purposes between African-Americans and the overall population was between one per 100 stops and three per 100 stops between 2012 and 2016, with the African-American rate being higher than the overall rate each year.

Result of Stop

Tables 13 through 15, and Figures 11 through 13, report the data on the outcomes of African-American traffic stops by year, with comparisons for their rates and disparity index scores to the city's overall rates and disparity index scores.

Table 13. African-American Stops Resulting in Citation: 2012-2016

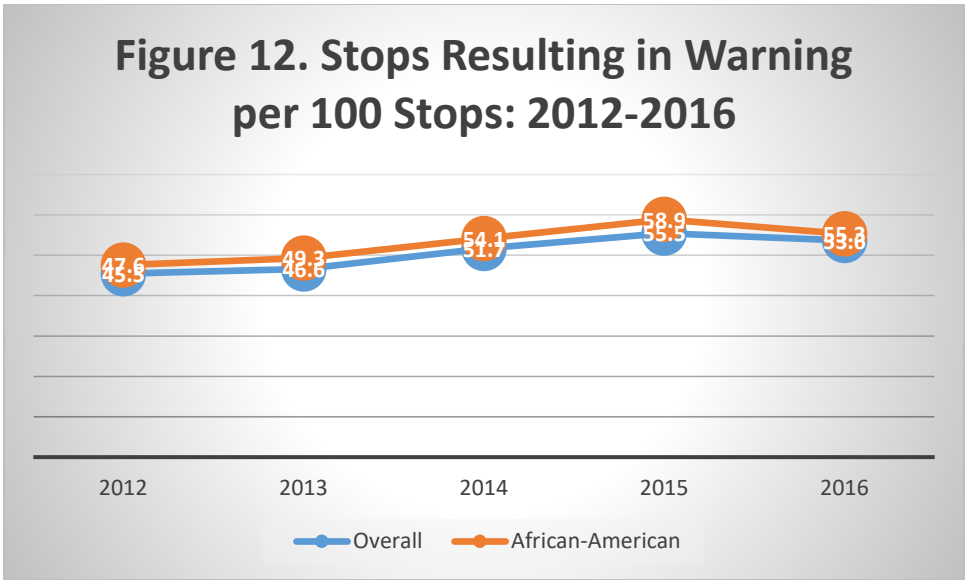
		All Citations	African-American Citations
2012	N	12,390	928
	Percentage		7.5%
	Disparity		0.87
	Rate	44.7	38.9
2013	N	12,547	954
	Percentage		7.6%
	Disparity		0.90
	Rate	45.5	40.8
2014	N	10,747	833
	Percentage		7.7%
	Disparity		0.86
	Rate	42.2	36.3
2015	N	9,207	730
	Percentage		7.9%
	Disparity		0.79
	Rate	35.9	28.5
2016	N	9,499	776
	Percentage		8.2%
	Disparity		0.82
	Rate	36.3	29.8



- African-Americans comprised 7.5 percent of all stops resulting in a citation in 2012. Their percentage increased slightly each year and was 8.2 percent in 2016.
- The disparity index for African-American stops resulting in a citation was less than 1.0 each year between 2012 and 2016, indicating that a lower proportion of African-American stops resulted in a citation than would be predicted given their proportion of all stops.
- For African-Americans, the rate of stops resulting in a citation declined from 38.9 per 100 stops in 2012 to 29.8 per 100 stops in 2016; a relative decrease of 23.4 percent. The rate for the overall population declined from 44.7 per 100 stops in 2012 to 36.3 per 100 stops in 2016; a relative decline of 23.1 percent.
- There was a consistent gap in stops resulting in a citation of about six per 100 stops between African-Americans and the overall population between 2012 and 2016.

Table 14. African-American Stops Resulting in Warning: 2012-2016

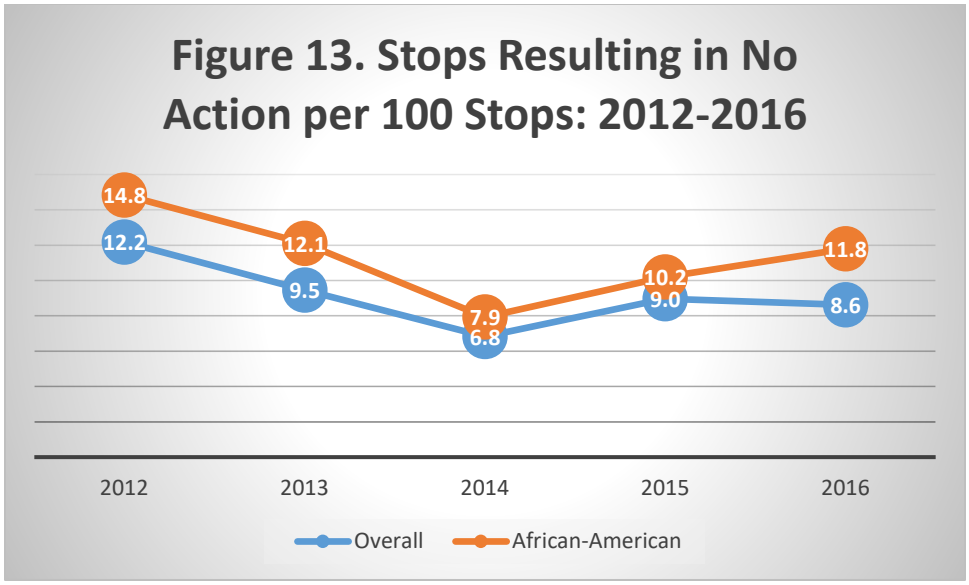
		All Warnings	African-American Warnings
2012	N	12,601	1,135
	Percentage		9.0%
	Disparity		1.05
	Rate	45.5	47.6
2013	N	12,853	1,153
	Percentage		9.0
	Disparity		1.06
	Rate	46.6	49.3
2014	N	13,148	1,243
	Percentage		9.4%
	Disparity		1.05
	Rate	51.7	54.7
2015	N	14,226	1,506
	Percentage		10.6%
	Disparity		1.06
	Rate	55.5	58.9
2016	N	14,052	1,440
	Percentage		10.2%
	Disparity		1.03
	Rate	53.6	55.3



- African-Americans comprised nine percent of stops resulting in a warning in 2012. Their percentage increased slightly to 10.2 percent of all stops resulting in a warning in 2016.
- The disparity index was slightly above 1.0 each year for African-American stops resulting in a warning between 2012 and 2016, indicating that the proportion of stops resulting in a warning was roughly what would be expected given their proportion of all stops.
- The African-American rate of stops resulting in a warning per 100 stops tracked the overall rate very closely between 2012 and 2016, with a gap of less than three per 100 stops over that period.

Table 15. African-American Stops Resulting in No Action: 2012-2016

		All No Action	African-American No Action
2012	N	3,376	354
	Percentage		10.5%
	Disparity		1.22
	Rate	12.2	14.8
2013	N	2,609	283
	Percentage		10.8%
	Disparity		1.28
	Rate	9.5	12.1
2014	N	1,737	182
	Percentage		10.5%
	Disparity		1.16
	Rate	6.8	7.9
2015	N	2,298	261
	Percentage		11.3%
	Disparity		1.14
	Rate	9.0	10.2
2016	N	2,257	307
	Percentage		13.6%
	Disparity		1.37
	Rate	8.6	11.8



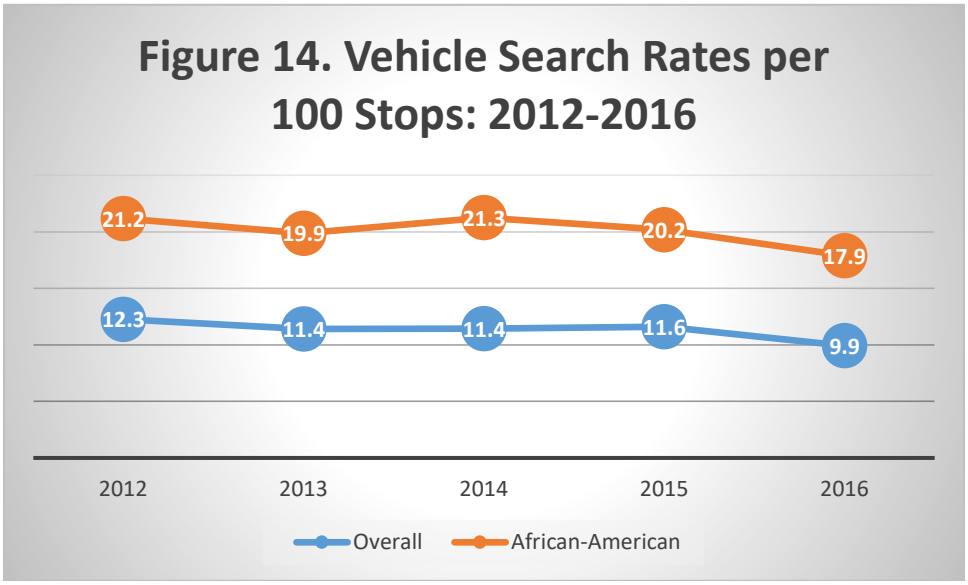
- African-Americans comprised 10.5 percent of stops resulting in no action in 2012, increasing slowly until 2016 where African-American drivers were 13.6 percent of the stops resulting in no action.
- The disparity index for African-American stops resulting in no action declined from 1.22 to 1.14 between 2012 and 2015, before increasing to 1.37 in 2016, indicating that the proportion of African-American stops that resulted in no action was 37 percent higher than would be predicted given their proportion of all stops.

Stops Resulting in Searches

Tables 16 through 19, and Figures 14 through 17, report the data on African-American stops during which searches were conducted by year, including the number of searches, the outcome of searches, and the probable cause given for searches, with comparisons for their rates and disparity index scores to the city's overall rates and disparity index scores.

Table 16. African-American Searches per Stop: 2012-2016

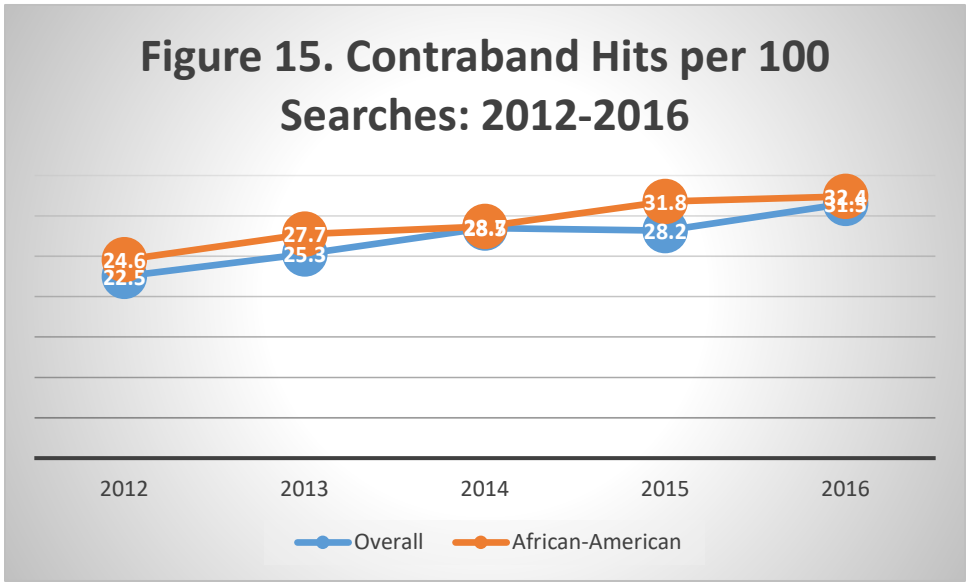
		All Searches	African-American Searches
2012	N	3,401	505
	Percentage		14.8%
	Disparity		1.72
	Rate	12.3	21.2
2013	N	3,148	465
	Percentage		14.8%
	Disparity		1.74
	Rate	11.4	19.9
2014	N	2,908	488
	Percentage		16.8%
	Disparity		1.86
	Rate	11.4	21.3
2015	N	2,980	516
	Percentage		17.3%
	Disparity		1.74
	Rate	11.6	20.2
2016	N	2,601	466
	Percentage		17.9%
	Disparity		1.80
	Rate	9.9	17.9



- The percentage of African-American stops resulting in searches increased between 2012 and 2016 from 14.8 percent to 17.9 percent.
- The disparity index for African-American searches slightly increased between 2012 and 2016. African-Americans were searched at a rate that was 72 percent higher than would be predicted given their proportion of all stops in 2012; in 2016, they were searched at a rate that was 80 percent higher.
- The rate for African-American stops resulting in searches declined from 21.2 per 100 stops in 2012 to 17.9 per 100 stops in 2016, with most of the drop occurring between 2015 and 2016.
- The gap between the rate of African-Americans stops resulting in searches and the overall rate of stops resulting in searches shrank slightly from 8.9 per 100 stops in 2012 to 8 per 100 stops in 2016; a relative decline of 10.1 percent.

Table 17. African-American Contraband Hits per Search: 2012-2016

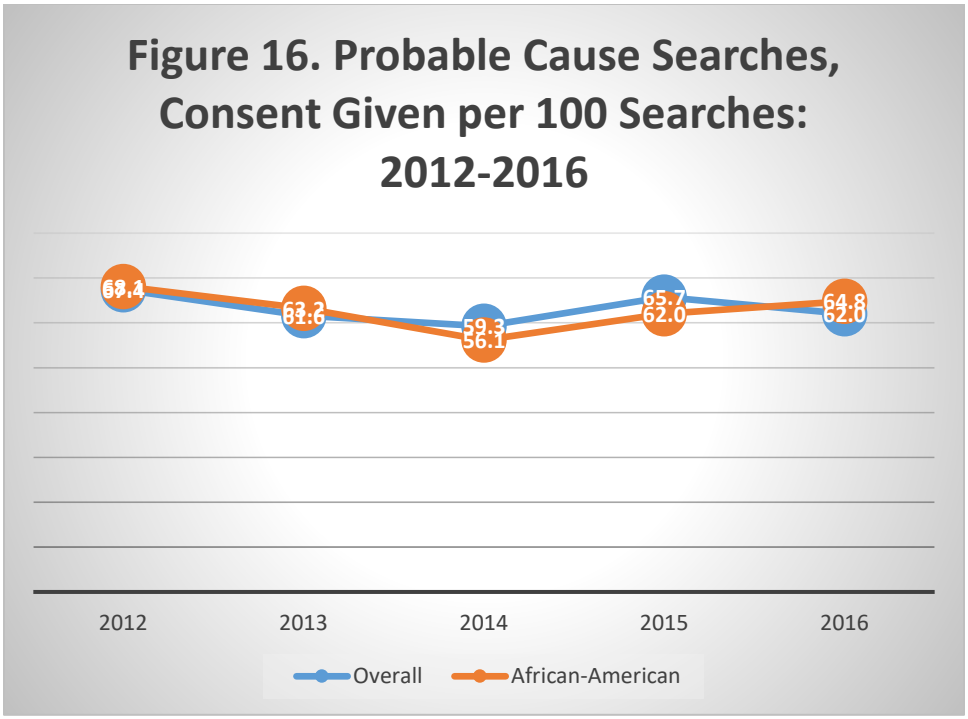
		All Contraband Hits	African-American Contraband Hits
2012	N	766	124
	Percentage		16.2%
	Disparity		1.09
	Rate	22.5	24.6
2013	N	796	129
	Percentage		16.2%
	Disparity		1.10
	Rate	25.3	27.7
2014	N	829	140
	Percentage		16.9%
	Disparity		1.01
	Rate	28.5	28.7
2015	N	839	164
	Percentage		19.5%
	Disparity		1.13
	Rate	28.2	31.8
2016	N	820	151
	Percentage		18.4%
	Disparity		1.03
	Rate	31.5	32.4



- The percentage of searches resulting in contraband hits for African-Americans increased slightly, from 16.2 percent in 2012 to 18.4 percent in 2016. The percentage peaked in 2015 when 19.5 percent of searches resulted in contraband hits for African-Americans.
- The disparity index of searches resulting in contraband hits for African-Americans was close to 1.00 or slightly higher between 2012 and 2016, which indicates that the proportion of searches that resulted in contraband hits for African-Americans was about what would be predicted given their proportion of all searches.
- The rate at which searches per 100 African-American drivers resulted in contraband hits increased from 24.6 in 2012 to 32.4 in 2016; a relative increase of 31.7 percent. Between 2012 and 2016 the rate of searches resulting in contraband hits increased from 22.5 per 100 to 31.5 per 100; a relative increase of 40 percent. So, the rate at which searches resulted in contraband hits increased more overall than it did for African-Americans between 2012 and 2016.
- There was a small gap of one to two contraband hits per 100 searches between African-Americans and the overall population between 2012 and 2016. African-American drivers were not found to have contraband at a rate that substantively differed from the overall population over the period covered in this study.

Table 18. African-American Probable Cause Searches, Consent Given: 2012-2016

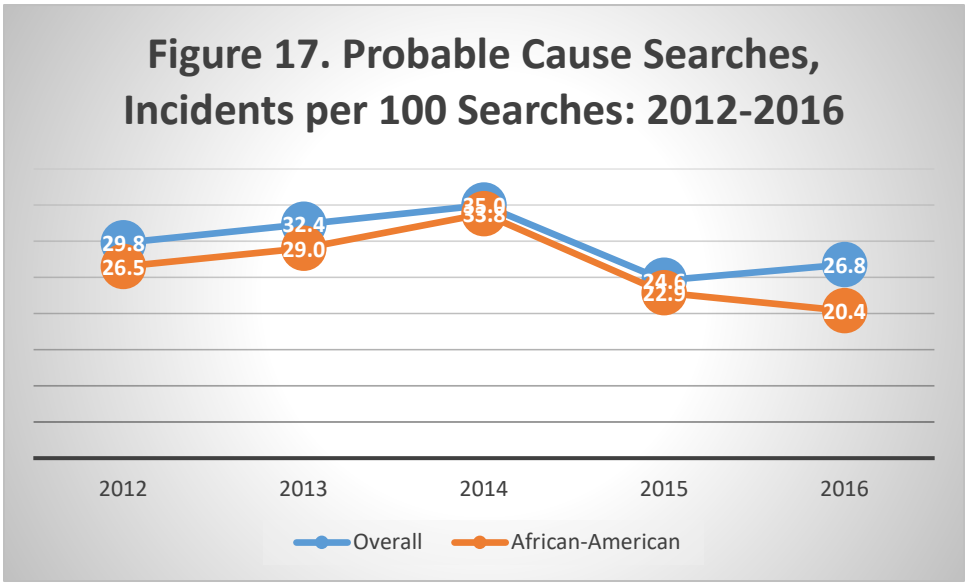
		All Consent	African-American Consent
2012	N	2,292	344
	Percentage		15.0%
	Disparity		1.01
	Rate	67.4	68.1
2013	N	1,940	294
	Percentage		15.1%
	Disparity		1.02
	Rate	61.6	63.2
2014	N	1,723	274
	Percentage		15.9%
	Disparity		0.95
	Rate	59.3	56.1
2015	N	1,958	320
	Percentage		16.3%
	Disparity		0.94
	Rate	65.7	62.0
2016	N	1,613	302
	Percentage		18.7%
	Disparity		1.04
	Rate	62.0	64.8



- African-Americans comprised 15 percent of searches where consent was given in 2012 and increased slowly to 18.7 percent in 2016.
- The disparity index for African-American searches where consent was given was right around 1.0 for each year between 2012 and 2016, indicating that the proportion of searches where consent was given for African-Americans was about what would be expected given their proportion of all searches.
- The rate of searches where consent was given for African-Americans declined from 68.1 per 100 searches in 2012 to 56.1 per 100 searches in 2014. It then increased to 64.8 per 100 searches in 2016.
- The rate of consent for African-Americans did not substantively differ from the rate for the overall population from 2012 to 2016.

Table 19. African-American Probable Cause Searches, Incident to Arrest: 2012-2016

		All Incidents	African-American Incidents
2012	N	1,014	134
	Percentage		13.2%
	Disparity		0.89
	Rate	29.8	26.5
2013	N	1,019	135
	Percentage		13.2%
	Disparity		0.90
	Rate	32.4	29.0
2014	N	1,018	165
	Percentage		16.2%
	Disparity		0.96
	Rate	35.0	33.8
2015	N	733	118
	Percentage		16.1%
	Disparity		0.93
	Rate	24.6	22.9
2016	N	697	95
	Percentage		13.6%
	Disparity		0.76
	Rate	26.8	20.4



- 13.2 percent of drivers who were searched due to an incident to arrest were African-American in 2012, which was consistent between 2012 and 2016, with the exception of

2014 and 2015 where they comprised about 16 percent of drivers searched due to an incident to arrest.

- The disparity index for African-American searches due to an incident to arrest was below 1.0 each year between 2012 and 2016, indicating that the proportion of such searches was lower than would be predicted given African-American's proportion of all searches.
- The rate at which African-American drivers were searched due to an incident to arrest declined from 26.5 per 100 searches in 2012 to 20.4 searches per 100 in 2016, a relative decrease of 23 percent. Over that same time period, the overall rate declined from 29.8 per 100 searches to 26.8 per 100 searches, a relative decrease of 10 percent.

Characteristics of Census Tracts and African-American Traffic Stops

Tables 20 through 22 describe the size and race/ethnic composition of census tracts where African-American stops occurred.

Table 20. Population Characteristics and Number of African-American Traffic Stops for Springfield Census Tracts (2012-2016)

	All Tracts Mean (N=51)	Low Stop Tracts Mean (N=32)	Moderate Stop Tracts Mean (N=13)	High Stop Tracts Mean (N=6)
Percent African-American	3.76%	2.81%	4.73%	6.75%
Percent Nonwhite	7.71%	6.53%	8.47%	12.35%
Percent White	89.27%	90.88%	88.00%	83.45%
Total Population	4,108.29	4,517.72	3,405.92	3,446.5
Number African-American Stops	441.16	202.56	695.00	1,163.67

Table 15 summarizes the race/ethnic composition, population size, and total number of African-American stops between 2012 and 2016 for Springfield census tracts. The first column shows the information for all 51 of the city's census tracts. The second column shows information for the 32 low stop census tracts where there were between 1 and 500 African-Americans stopped. The third column shows information for the 13 moderate stop census tracts where there were between 501 and 1000 African-Americans stopped. The fourth column shows information for the 6 census tracts where there were between 1,001 and 1,388 African-Americans stopped. The majority, 57 percent, of all African-American traffic stops between 2012 and 2016 took place in the six highest stop tracts. Tract characteristics are derived from data obtained from the 2010 census. Highlights from Table 15 include:

- According to the first column, there was an average of 441 African-Americans stopped per census tract between 2012 and 2013.
- Tracts with a lower average number of African-American traffic stops were less diverse racially and had larger populations than the moderate and high stop tracts, whereas the tracts with the highest average number of African-American traffic stops tended to be more racially diverse and smaller in population size than low and moderate stop tracts.

Table 21. Pearson's r Correlation Coefficients for Tract Characteristics and African-American Traffic Stops (2012-2016)

	African-American Stops
Proportion African-American	.606***
Proportion Nonwhite	.623***
Proportion White	-.675***
Population Size	-.366***
***p<.001	

Table 16 reports correlation coefficients[10] for the association between the number of African-American traffic stops in a tract and the tracts race/ethnic composition and population size. There was a moderate, positive correlation between the number of African-American stops and the diversity of census tracts. There was a moderate, negative correlation between the number of African-American stops and the proportion of white residents in tracts, and a weaker negative correlation between the number of African-American stops and the size of the tract population.

- Overall, tracts with a higher average number of African-American traffic stops tend to be more racially diverse and smaller than tracts with a lower average number of African-American traffic stops.

Table 22. Detailed Characteristics of Tracts with High Numbers of African-American Traffic Stops (2012-2016)

Tract Id	African-American Stops (N)	Percent African-American	Percent Nonwhite	Percent White	Total Population (N)
1.00	1,009	5.52%	14.43%	81.38%	1,649
4.00	1,049	4.36%	10.32%	86.08%	4,362
5.02	1,095	7.09%	14.15%	82.03%	3,273
6.00	1,388	7.99%	12.17%	82.82%	2,991
7.00	1,327	9.91%	14.62%	81.02%	3,946
55.00	1,114	5.63%	8.41%	87.39%	4,458

Table 17 provides detailed information on the six tracts with the highest number of African-American stops.

- Geographically, the tracts that had the highest number of African-American stops between 2012 and 2016 were concentrated in two parts of Springfield. Tracts 1.00, 4.00, and 5.02 are clustered in Central Springfield in an area just north and south of E Grand

[10] Correlation coefficients report the strength and direction of an association between two variables. The coefficients have possible values ranging from 0 to ±1.0. A positive value indicates that there is a positive relationship (as scores on one variable increase, scores on the other also increase) and a negative value indicates a negative relationship (as scores on one variable increase, scores on the other decrease). A score of zero indicates that there is no association, while scores closer to ±1.0 indicate a strong association.

St. Tracts 6.00, 7.00, and 55.00 are clustered in North Central Springfield between I-44 and State Rte. 744.

Summary of Main Findings

- Overall, African-Americans comprise just under four percent of the city's driving age population, but comprised just over nine percent of all traffic stops, on average, from 2012 to 2016. They were the only minority group whose average percentage of stops exceeded their percentage of the driving age population.
- The race of the driver was not determined until after the stop for the overwhelming majority of stops for all races from 2012 to 2016. However, race was determined prior to the stop more frequently for white and African-American drivers than for other races.
- African-Americans were also the only group with an average disparity index over 1.00 between 2012 and 2016. African-American drivers were nearly 2.5 times more likely to be stopped than would be predicted given their percentage of the driving age population.
- African-Americans had the highest average stop rate, by far. The African-American average stop rate was nearly 2.5 times the average overall stop rate per 100 driving age Springfieldians from 2012 to 2016. All other groups were stopped at a rate lower than the overall average.
- Disparities in African-American traffic stops increased from 2012 to 2016.
- The gap between the African-American stop rate and the city's overall stop rate increased from 2012 to 2016.
- There was not a clear linear pattern in the disparity index for African-American stops resulting in arrest between 2012 and 2016. African-American stops resulted in arrest 43 percent more of the time than would be predicted based on their proportion of stops in 2012; the disparity index for African-American stops resulting in arrest increased until 2016, when it was 40 percent greater than would be predicted based on their proportion of stops.
- The rate for African-American arrests fell from 2012 to 2016. There was a spike in the arrest rate in 2014.
- The gap in the rate at which African-American stops resulted in arrest and the city's overall rate declined from 2012 to 2016. There was a spike in the gap in 2014.
- The majority of African-American drivers who were arrested were arrested due to a warrant.
- There was an increase in the disparity index for investigative stops for African-Americans from 2012 to 2016.
- The rate of stops for investigative for African-American drivers increased from 2012 to in 2015. The rate declined in 2016.
- The disparity index for African-American stops resulting in no action declined between 2012 and 2015, before increasing in 2016.
- The disparity index for African-American searches slightly increased between 2012 and 2016. African-Americans were searched at a rate that was 72 percent higher than would be predicted given their proportion of all stops in 2012; in 2016, they were searched at a rate that was 80 percent higher.
- The disparity index of searches resulting in contraband hits for African-Americans was close to 1.00 or slightly higher between 2012 and 2016, which indicates that the

proportion of searches that resulted in contraband hits for African-Americans was about what would be predicted given their proportion of all searches. It does not appear that the disparity in searches for African-Americans is attributable to a greater propensity to be in possession of contraband.

- The disparity index for African-American searches due to an incident to arrest was below 1.0 each year between 2012 and 2016, indicating that the proportion of such searches was lower than would be predicted given African-American's proportion of all searches.
- Tracts with a lower average number of African-American traffic stops were less diverse racially and had larger populations than the moderate and high stop tracts, whereas the tracts with the highest average number of African-American traffic stops tended to be more racially diverse and smaller than low and moderate stop tracts.
- Geographically, the tracts that had the highest number of African-American stops between 2012 and 2016 were clustered in Central Springfield just north and south of E Grand St., and in North Central Springfield between I-44 and State Rte. 744.

Appendix

Below is detailed information on the formulas that were used to calculate the statistics presented in the report:

Stops, Searches, and Arrests

Percent stops = (number of stops/total number of stops) * 100
Percent searches = (number of searches/total number of searches) * 100
Percent contraband hit = (number of contraband hits/total number of contraband hits) * 100
Percent arrest = (number of arrests/total number of arrests) * 100
Stops disparity index = (proportion of stops / proportion of population). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Searches disparity index = (proportion of searches/proportion of stops).
Contraband disparity index = (proportion of contraband hits / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Arrest rate disparity index = (proportion of arrests / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Stop rate = (stops/population 16+) X 100.
Search rate = (searches / stops) X 100.
Arrest rate = (arrests / stops) X 100.
Contraband hit rate = (searches with contraband found / total searches) X 100.
Percent consent = (number consent/ total number consent) *100
Percent incident to arrest = (number incident to arrest/ total number incident to arrest) * 100
Percent contraband = (number contraband/ total number contraband) * 100
Consent disparity index = (proportion giving consent to be searched / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Incident to arrest disparity index = (proportion incident to arrest / proportion of searches). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Consent rate = (number consent/ number searches) * 100
Incident to arrest rate = (number incident to arrest/ number of searches) *100

Reason for Arrest

Percent arrest due to warrant = (number of arrest due to warrant/number of arrests) * 100
Arrest due to warrant disparity index = (proportion arrests due to warrant/proportion of arrests).
Warrant arrest rate = (number of arrests due to warrant/number of arrests) * 100
Percent arrest due to drugs = (number of arrest due to drugs/number of arrests) * 100
Arrest due to drugs disparity index = (proportion arrests due to drugs/proportion of arrests).
Drug arrest rate = (number of arrests due to drugs/number of arrests) * 100
Percent arrest due to DWI = (number of arrest due to DWI/number of arrests) * 100
Arrest due to DWI disparity index = (proportion arrests due to DWI/proportion of arrests).

DWI arrest rate = (number of arrests due to DWI/number of arrests) * 100
Percent arrest due to traffic violation = (number of arrest due to traffic violation/number of arrests) * 100
Arrest due to traffic violation disparity index = (proportion arrests due to traffic violation/proportion of arrests).
Warrant arrest rate = (number of arrests due to traffic violation/number of arrests) * 100

Reason for Stop
Percent moving violations = (number of moving violations/ total number of moving violations) *100
Percent equipment violations = (number of equipment violations/ total number of equipment violations) * 100
Percent license violations = (number of license violations/ total number of license violations) * 100
Percent investigative = (number of investigative/ total number of investigative) *100
Moving disparity index = (proportion of moving violations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Equipment disparity index = (proportion of equipment violations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
License disparity index = (proportion of license violations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Investigative disparity index = (proportion of investigative stops / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Moving rate = (number of moving violations/ number of stops) *100
Equipment rate = (number of equipment violations/ number of stops) * 100
License rate = (number of license violations/ number of stops) * 100
Investigative rate = (number of investigative stops/ number of stops) * 100

Result of Stop
Percent citation = (number of citations/ total number of citations) * 100
Percent warning = (number of warnings/ total number of warnings) * 100
Percent no action = (number no action/ total number no action) *100
Citation disparity index = (proportion of citations / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Warning disparity index = (proportion of warnings / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
No action disparity index = (proportion of no action / proportion of stops). A value of 1 represents no disparity; values greater than 1 indicate over-representation, values less than 1 indicate under-representation.
Citation rate = (number of citations/ number of stops) *100
Warning rate = (number of warnings/ number of stops) *100

No action rate = (number no action/ number of stops) * 100